A review of work characteristics related to return to work after coronary heart diseases.

Marco M Ferrario, MD and Rossana Borchini, MD
Research Centre on Epidemiology and Preventive Medicine.
Department of Clinical and Experimental Medicine.
University of Insubria at Varese
Unit of Occupational Medicine, Varese Hospital, Varese, Italy.
Aims and Methods

A search in PubMed was made looking for interventions and epidemiologic observations published from 2000 on, which have addressed the return to work (RTW) of CHD patients. Reviews and clinical observations on a small number of patients were excluded. We found n. 9 papers reporting new results and none of them were RCTs.

More recent reviews were then taken into account to highlight the need for further studies and to give recommendations, based on evidences at present available.
Recent findings on return to work after an acute myocardial infarction or coronary artery bypass grafting.

Boudrez H, De Backer G. - Cardiac Rehabilitation Centre, Gent University Hospital, Belgium.
Acta Cardiol 2000;55(6):341-9

RTW observed in 83.3% of the 222 study patients: 87.2% of the AMI and 80.8% of the CABG patients.
The mean delay time for RTW was 14.8 weeks.

After one year, RTW of AMI patients was related to:
• less negative affect,
• less somatic and cognitive complaints.
RTW was not related to morbidity score.

Variables predicting RTW in CABG patients were mainly psychological variables: trust, job security, positive expectations concerning return, no stress, less somatic complaints, less physical exertion of the job.
Work-related outcomes after a myocardial infarction.


232 AMI patients interviewed by telephone 7-month after discharge to determine work status before and after myocardial infarction. 89 patients who had worked before, 21 (23.6%) did not RTW. Variables associated with not RTW were: previous MI, CABG surgery, heart failure, positive stress test, low score on the Physical Component Summary scale, more comorbidities and more prescribed drugs.

Pre-existing cardiac disease and poorer physical functioning were consistently related to worse work-related outcomes.

This small study demonstrates the need for a larger, broader study that includes health beliefs, treatment, and other job and patient factors that may influence work-related outcomes.
At 12 months, 302 (79.9%) of the 378 patients were employed, 32 (8.5%) unemployed, 20 (5.3%) retired, and for 24 (6.3%) the employment status was unknown.

Non-RTW was more likely if patients were not intending to RTW, had a negative perception of health or comorbidities and reported financial stress.

Predictors of delayed-RTW were cardiac rehabilitation attendance, longer hospital stay, past angina, having a manual job, physically active work, job dissatisfaction, and depression.
Does job satisfaction predict early return to work after coronary angioplasty or cardiac surgery?


83 patients in working age who had PCI or CABG. Time to RTW was assessed at the 6-month occupational physician examination. **Job satisfaction** was measured during cardiac rehabilitation.

Participants with high job satisfaction were more likely to RTW (OR = 5.92 (95%CI, 1.69-20.73) in the most-adjusted model, compared to participants with low job satisfaction.

**Satisfaction with the organizational processes** was the job satisfaction component strongly associated with early RTW (OR = 4.30; 1.2-15.0).

The results suggested that **when patients are satisfied with their job and positively perceived their work environment, they will be more likely to early RTW, independently of socio-demographic, medical and psychological factors.**
Effect of job strain and depressive symptoms upon returning to work after acute coronary syndrome.


240 employed US and Japanese W&M hospitalised for ACS.

At 6 months post-hospitalization, a questionnaire was administered to investigate timing of RTW and presence of depressive symptoms.

Job strain was a significant independent predictor of a later RTW, after controlling for potential confounding variables.

In addition, depressive symptoms delay RTW.

An earlier RTW might be promoted by interventions focused on reducing psychological job demand, increasing perceived job control, and treating depressive symptoms.
Work adjustment in cardiovascular disease: job characteristics and social support.


Questionnaire data collected from patients either at program entry (n = 126) or 6 to 12 months (n = 88) after CR.

Working patients reported higher levels of employer support and lower physical demands than those not working. Weaker associations observed with family support and physician support.

Findings suggest that CR patients view their employer as a significant source of social support for RTW.

Efforts to foster support from employers are an important consideration for the functional rehabilitation of these workers.
WORK STRESS AND THE RISK OF RECURRENT CORONARY HEART DISEASE EVENTS: A SYSTEMATIC REVIEW AND META-ANALYSIS

JIAN LI, MIN ZHANG, ADRIAN LOERBROKS, PETER ANGERER, and JOHANNES SIEGRIST

http://dx.doi.org/10.2478/s13382-014-0303-7

Table 1. Summary of the prospective studies on work stress and the risk of recurrent coronary heart disease (CHD) events

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<th>Study (country)</th>
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<th>Period of follow-up (years)</th>
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<th>Return to work and retirement</th>
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<tr>
<td>Theorell et al., 1991 [29] (Sweden)</td>
<td>62 men with the 1st myocardial infarction before the age of 45</td>
<td>5.0</td>
<td>job strain at baseline (within 2 weeks of discharging from the referring hospital)</td>
<td>ischaemic heart disease death (13 cases)</td>
<td>all returned to the same work; nobody was retired</td>
<td>number of stenosed coronary arteries, degree of coronary atherosclerosis, and age at the onset of the 1st myocardial infarction</td>
</tr>
<tr>
<td>Orth-Gomér et al., 2000 [20] (Sweden)</td>
<td>130 working women aged 30–65 years with the 1st acute myocardial infarction or unstable angina pectoris</td>
<td>4.8</td>
<td>job strain at baseline (3–6 months after hospitalization)</td>
<td>cardiac death, acute myocardial infarction, or revascularization procedures (38 cases)</td>
<td>all returned to the same work; no information on retirement</td>
<td>age, estrogen status, educational level, marital stress, diagnosis at index event, symptoms of heart failure, systolic blood pressure, diabetes mellitus, smoking, triglyceride level, and high-density lipoprotein cholesterol level</td>
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# Work Stress and the Risk of Recurrent Coronary Heart Disease Events: A Systematic Review and Meta-Analysis

Jian Li, Min Zhang, Adrian Loerbroks, Peter Angerer, and Johannes Siegrist

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<td>Aboa-Eboulé et al., 2007 [31] (Canada)</td>
<td>972 subjects (866 men, 106 women) aged 35–59 years with the 1st myocardial infarction</td>
<td>5.9</td>
<td>job strain at baseline (6 weeks after return to work)</td>
<td>fatal CHD, nonfatal myocardial infarction, or unstable angina (206 cases)</td>
<td>all returned to work (M: 3.6 months after the 1st myocardial infarction); no information on retirement</td>
<td>age, gender, marital status, education, perceived economic situation, smoking status, body mass index, alcohol consumption, physical activity, number of recommended medications, hypertension, dyslipidemia, diabetes, family history of coronary heart disease &lt; 60 years, left ventricular ejection fraction, number of prior comorbid conditions, thrombolysis, number of in-hospital events, chronic social support at work, number of physical and chemical exposures at work, alexithymia, hostile affect, suppressed anger, number of adverse work organization factors, social support outside work, and psychological distress</td>
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<td>László et al., 2010 [21] (Sweden)</td>
<td>676 working subjects (78.9% men) aged 45–65 years with the 1st myocardial infarction</td>
<td>8.5</td>
<td>job strain at baseline (a few days after the 1st myocardial infarction)</td>
<td>cardiac death or non-fatal myocardial infarction (155 cases)</td>
<td>no information</td>
<td>age, gender, education, occupational class, managerial status, overtime work, shiftwork, and household work</td>
</tr>
<tr>
<td>Aboa-Eboulé et al., 2011 [22] (Canada)</td>
<td>738 subjects (669 men, 69 women) aged 35–59 years with the 1st myocardial infarction</td>
<td>4.0</td>
<td>Effort-Reward Imbalance at baseline (2 years after the 1st myocardial infarction)</td>
<td>fatal CHD, nonfatal myocardial infarction, or unstable angina (96 cases)</td>
<td>all returned to work (M: 3.6 months after the first myocardial infarction); no information on retirement</td>
<td>age, gender, the number of prior comorbid conditions, thrombolysis, the number of recommended medications, the number of adverse work organization factors, social support outside work, alexithymia, and job strain</td>
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Study | Job Strain | Effort-Reward Imbalance
---|---|---
Orth-Gomér et al., 2000 [20] (Swedish women) | 1.67 (0.64–4.32) | 1.75 (0.99–3.08)
Aboa-Eboulé et al., 2007 [31] (Canadian men and women) | 1.45 (0.82–2.58) | 1.75 (0.99–3.08)
László et al., 2010 [21] (Swedish men and women) | 1.73 (1.06–2.83) | 1.75 (0.99–3.08)
Subtotal | 1.61 (1.14–2.28) | 1.75 (0.99–3.08)
Overall | 1.65 (1.23–2.22) | 1.75 (0.99–3.08)
Job strain and risk of acute recurrent coronary heart disease events.


To determine whether job strain increases the risk of recurrent CHD events.
Prospective cohort study of 972 W&M, 35-59 years, who RTW after a first MI and were then followed up for almost 10 years.
Patients were interviewed at baseline (on average 6 weeks after RTW), then after 2 and 6 years.
Job strain, a combination of high PJD and low DL. A chronic job strain (CJS) variable, based on 2 interviews, when high strain at both interviews. Outcome was a composite of fatal CHD, nonfatal MI, and unstable angina.

In the unadjusted analysis, CJS was associated with recurrent CHD after 2.2 years of follow-up (HR=2.20; 95%CI, 1.32-3.66).

CJS remained an independent predictor of recurrent CHD in a multivariate model adjusted for 26 confounding factors (HR = 2.00; 1.08-3.72).
Evaluating work capacity after myocardial infarct.


Work resumption of patients after myocardial infarction is primarily dependent on left-ventricular function, stress-related ischemia and rhythm-disturbances, additionally the general physical and psychological state play an important role.

The basic examination includes not only the history and physical examination, but also resting ECG, ECG exercise testing, 2-dimensional echocardiogram and Holter-ECG. Additionally, stress-echocardiogram, nuclear exercise testing and invasive procedures can be necessary.

It is possible to estimate the work-capacity of the patient by classifying the ECG testing and by regarding further details of the disease.

The return-to-work-rate does not only depend on the severity of a CHD, but also on the age, education, social class, high physical activity during work, job related satisfaction, family situation and available suitable jobs on the labor market.
Summarising findings so far.

In 8-12 month time from the AC events or CA artery bypass grafting, between 14 and 25%, with variations based mainly on disease severity, did not RTW. Mostly one fourth of them retired and the majority remained unemployed.

Most of the studies focused on patient characteristics, individual psychologic profiles, disease severity/complications and effects of CR.

The more frequently reported work related investigated factors facilitating RTW were: job satisfaction with organizational processes, employer support, low physical demand on the tasks, non-manual jobs, low job strain, higher social support.
Work stress and cardiovascular disease: a life course perspective

Jian Li\textsuperscript{1}, Adrian Loerbroks\textsuperscript{1}, Hans Bosma\textsuperscript{2} and Peter Angerer\textsuperscript{1}

J Occup Health 2016; 58: 216-219

Step 1: Work Stress Increases the Risk of Incident CVD in Healthy Workers.

Step 2: Work Stress Determines the Process of Return to Work after CVD Onset.

Step 3: Patients with CVD Experience Higher Work Stress after Return to Work.

Step 4: Work Stress Increases the Risk of Recurrent CVD in Workers with CVD.

Step 5: Patients with CVD Who Suffer Full and Permanent Loss of Work Ability Transit to Disability Retirement.

Step 6: Disability Retirees due to CVD are at Increased Risk of CVD Mortality.

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Step 2: Work Stress Determines the Process of Return to Work after CVD Onset.

The routine cardiac rehabilitation (CR) programs do not include any educational and training activities concerning psychosocial stress in the workplace.

Accordingly, recent recommendations from the Cardiac Rehabilitation Section of the European Association of Cardiovascular Prevention and Rehabilitation of the European Society of Cardiology are, however, highlighting the importance of psychosocial risk factors including work stress as "a component of every CR program."

Step 3: Patients with CVD Experience Higher Work Stress after Return to Work.

Nevertheless, only one observational study measured work stress before and after first CVD onset; this study suggested that work stress levels increased after the workers with CVD returned to work.

CR programs might be helpful to address this issue: a preliminary study showed supportive evidence that an additional second phase of CR addressing work stress may significantly reduce psychosocial stress at work in patients with CVD after their return to work.

Heart disease and work: from rehabilitation to return to work.


Improvements in treatment of AMI contribute to increase patient survival, thus increasing the prevalence of the disease, even in the working age.

*RTW is an important aspect of patient quality of life.*

Criteria are proposed for the assessment of reintegration at work of CVD patients, accounting for the *residual clinical and functional working capacity* in relation to the physical working conditions. There are tools able to monitor the CVD system during work.

Close cooperation between the occupational physicians and cardiovascular rehabilitation specialists is required.

Much more evidences are needed to establish criteria to assess the psycho-social work environment and specific organizations.
At present work-related conditions facilitating RTW in CHD patients are still poorly studied. Further research is needed to characterise to which degree RTW influences perceived quality of life as well as interventions based on consultation and advice from occupational physicians.
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